

## CHAPTER 1 — INTRODUCTION

The U.S. Department of the Interior (USDI), Bureau of Land Management (BLM) Pinedale Field Office (PFO) and Rock Springs Field Office (RSFO) have received a proposal from EnCana Oil and Gas (USA), Inc. (EnCana), BP America Production Company (BP America), and other companies (referred to as "Operators") to expand the existing Jonah Field natural gas drilling and development operations in south-central Sublette County approximately 32 miles southeast of Pinedale, 28 miles northwest of Farson, and 1.5 to 11.0 miles west of U.S. Highway 191 (Map 1.1). Expanded development is proposed in portions of Townships 28 and 29 North (T28N-T29N), Range 107, 108, and 109 West.

The project is referred to as the Jonah Infill Drilling Project (the Project), and the total Jonah Infill Drilling Project area (JIDPA) includes approximately 30,500 acres. This acreage includes approximately 28,580 acres of federal surface and mineral estate managed by the BLM, 1,280 acres of State of Wyoming surface and minerals, and 640 acres of private surface/federal minerals. The JIDPA includes the entire area formerly described as the Modified Jonah Field II Project Area (MJ2PA) (BLM 2000a) but has been expanded to include the N½ of Section 23, T28N, R109W for analysis purposes, since natural gas development from the same productive formation has occurred in this area.

Based on Operator knowledge of natural gas reservoir characteristics (geology, flow from existing wells, anticipated recovery rates, and economics), the Operators anticipate field development in the JIDPA to involve infill drilling among existing wells. The Operators propose drilling and developing up to 3,100 additional new wells in the JIDPA depending on the outcome of continued exploration and reservoir characterization. Bottom-hole (subsurface) well spacing is expected to range from 16 wells/640-acre section up to as many as 128 wells/section (1 well/5 acres). The Operators propose a minimum of 64 well pads per section. The construction of various ancillary facilities such as roads, pipelines, water wells, water disposal sites, and compressor station expansions would occur in association with the expanded development. Because Operators have identified the potential for up to 3,100 new wells with associated facilities on up to 16,200 of new surface disturbance, the BLM has determined it prudent to prepare an environmental impact statement (EIS) to analyze the impacts associated with this level of development.

The proposed Project is a major expansion of existing natural gas development operations as initially proposed and authorized in the Jonah Field II Natural Gas Project EIS (BLM 1997a, 1998a) and its Record of Decision (ROD) (BLM 1998b) and subsequently revised by the Environmental Assessment (EA), Finding of No Significant Impact (FONSI), and Decision Record (DR) for the Modified Jonah Field II Project (BLM 2000a, 2000b).

The purpose of this EIS is to provide the public and decision-makers with sufficient information to understand the estimated environmental consequences of implementing the Project. This EIS assesses the estimated environmental impacts of the No Action Alternative, the Proposed Action, seven alternatives, and the BLM Preferred Alternative (see Chapter 2). The analyses in this EIS



Map 1.1      Jonah Infill Drilling Project Location, Sublette County, Wyoming, 2005.

were also used to identify and develop appropriate mitigation measures to minimize environmental impacts.

The BLM PFO is the lead agency for this EIS since the majority of development is proposed for lands under their jurisdiction. The BLM (PFO and RSFO) has provided guidance, input, participation, and independent evaluation during EIS preparation. The State of Wyoming participated in the preparation of this EIS as a cooperating agency; state agencies specifically participating include the Office of State Lands and Investments, Wyoming Department of Environmental Quality (WDEQ), Wyoming Oil and Gas Conservation Commission (WOGCC), Wyoming State Geological Survey (WSGS), Wyoming State Engineer's Office (WSEO), Wyoming Department of Agriculture (WDA), Wyoming Game and Fish Department (WGFD), Wyoming State Historic Preservation Office (SHPO), Wyoming State Parks and Historic Sites, Wyoming Business Council, and Wyoming Department of Transportation. The BLM, in accordance with 40 C.F.R. 1506.5(a) and (c), is in agreement with the information and analyses presented in this EIS and approves and takes responsibility for the scope and content of this document.

Standard operating procedures and practices currently used in gas field development throughout Wyoming and the surrounding region would be employed for this Project (see Appendix G). Construction, development, production, and abandonment would comply with all applicable federal, state, and county laws, rules, and regulations (see Section 1.3). Numerous standard, Project-specific, and site-specific mitigation measures would be employed during all phases of the Project to avoid, minimize, or mitigate potential impacts to the environment (see Appendix A: *BLM Standard Stipulation/Mitigation Requirements* and Appendix B: *Operator-Committed Practices*). Reclamation would be conducted as soon as practical on disturbed areas. Upon Project completion, all wells would be plugged and abandoned, surface facilities would be removed, and most disturbed areas would be reclaimed and revegetated.

Pursuant to the *National Environmental Policy Act of 1969* (NEPA), as amended, and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 *Code of Federal Regulations* [C.F.R.] 1500-1508), the BLM has prepared this EIS to describe and evaluate the probable impacts of the Proposed Action and other alternative actions.

This EIS incorporates key provisions of *Federal Land Policy and Management Act of 1976* (FLPMA) to manage public lands and their resource values to "best meet the present and future needs of the American people" (Section 103 [43 U.S.C. 1702]) and to coordinate resource management "without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or greatest unit output" (Section 103 [43 U.S.C. 1702]). FLPMA also says that it is appropriate that some lands be used "for less than all of the resources" (Section 103 [43 U.S.C. 1702]). The proposed Project is compliant with resource management regulations (43 C.F.R. 1610).

## 1.1 PURPOSE AND NEED

The proposed development meets the purpose and need of BLM Resource Management Plan (RMP) minerals development objectives. These objectives are:

- to maintain or enhance the opportunities for mineral exploration and development, while protecting other resource values;

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- to provide for oil and gas leasing, exploration, and development while protecting other values;
  - to consider the conservation and enhancement of natural resources with the economic benefits of resource development;
  - to coordinate land use decisions with economic factors and needs;
  - to plan land use consistent with the orderly development, use, and conservation of resources while preserving environmental quality; and
  - to plan uses that encourage energy conservation.

The purpose of the proposed development is also to enable the commercial production by Operators of federally owned natural gas in conformance with BLM RMP oil and gas objectives, pursuant to their rights under existing oil and gas leases issued by the BLM, and to prevent drainage of federal minerals by wells located on adjacent nonfederally owned lands (i.e., State of Wyoming lands). All of the federally owned minerals in the JIDPA have been leased. National mineral leasing policies and the regulations by which they are enforced recognize the statutory right of lease holders to develop federal mineral resources to meet continuing national needs and economic demands as long as unnecessary and undue environmental degradation is not incurred.

Natural gas is an integral part of the U.S. energy future due to its availability and the presence of an existing market delivery infrastructure. By developing domestic reserves of natural gas, the U.S. reduces its dependence on foreign sources of energy while maintaining an adequate and stable supply of fuel to maintain economic well-being, industrial production, and national security. According to the American Gas Association (2003), 99% of the natural gas used in the U.S. is produced in North America (85% in the U.S. and nearly 15% in Canada), supplies are abundant, and demand is anticipated to increase 45% by 2015 and 53% by 2020; this project would assist in providing natural gas to meet anticipated demand. Demand has increased 35% in the last decade. The National Petroleum Council (2003) estimates that natural gas provides nearly one-quarter of all U.S. energy requirements, about 19% of electric power generation, and is used for heating and cooking in over 60 million U.S. households. U.S. industries get over 40% of all their primary energy from natural gas.

The true measure of energy efficiency is total energy efficiency. Total energy efficiency (TEE) takes into account all of the energy used or lost in the production, processing, and delivery steps involved in supplying energy to run factories, businesses, homes, and vehicles, plus the efficiency of the energy-using product itself (American Gas Association, 2003). Natural gas is delivered to the consumer with a TEE of about 90%, whereas electricity is delivered with a TEE of about 27%. The use of natural gas in chemical and energy production applications results in lower air pollutant emissions than does the comparable use of other fossil fuels. For instance, burning natural gas rather than coal results in a reduction of 85-96% in the pounds of emissions per million British Thermal Units (BTUs) of energy produced (American Gas Association 2003). The environmental advantages of burning natural gas are emphasized in the *Clean Air Act Amendments of 1990*.

Development of new gas resources like those proposed by the Operators in the JIDPA is consistent with the Comprehensive National Energy Strategy announced by the U.S. Department of Energy (DOE) in April 1998 (DOE 1998), and meets the purpose and need of the Energy

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Policy and Conservation Act (42 *United States Code* [U.S.C.] 6201). That strategy is designed to guide national policy toward energy security, economic expansion, and greater protection of the environment. One of the goals of that strategy is to ensure against energy disruptions by increasing production of domestic sources of natural gas.

## 1.2 NATIONAL ENVIRONMENTAL POLICY ACT

This EIS was prepared in accordance with NEPA and is in compliance with all applicable regulations and laws subsequently passed, including regulations (40 C.F.R. 1500-1508), USDI requirements (*Department Manual* [DM] 516 [516 DM 1 through 6], *Environmental Quality* [USDI 2004]), guidelines listed in the BLM *National Environmental Policy Act Handbook, H-1790-1* (BLM 1988a), *Guidelines for Assessing and Documenting Cumulative Impacts* (BLM 1994c), and CEQ's *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997).

## 1.3 DECISIONS TO BE MADE

The decision the BLM will make as a result of the analysis presented in this EIS is whether to allow, and under what conditions to allow, the development, operation, maintenance, and reclamation of expanded development/surface disturbances on federal land in the JIDPA. BLM will determine what level of impacts are approved, and what Conditions of Approval (COAs), Best Management Practices (BMPs), mitigation, monitoring, and surveying would be required.

The ROD associated with this EIS will not be the final review or the final approval for all actions associated with this proposal. The BLM must analyze and authorize each component of the project that involves the disturbance of federal lands on a site-specific basis. The method used to evaluate and authorize each surface-disturbing activity is an Application for Permit to Drill (APD), right-of-way (ROW) grant, or Sundry Notice, with supporting Environmental Assessment (EA), which would be required before any construction can occur.

### Pinedale Field Office RMP Amendment Decision

The Notice of Intent (NOI) for this Project (see Section 2.1) indicated the possible need for an RMP amendment. Determination of need to amend an RMP as a result of newly proposed oil and gas development projects was based on several factors including, but not limited to number of new wells, acres of new long-term surface disturbance, and conformance of the project with RMP objectives. Paramount among these factors is whether or not approving a proposed project would meet RMP objectives. An update to the PFO RMP was provided in the ROD for the Pinedale Anticline Oil and Gas Exploration and Development Project (BLM 2000c). That ROD set an oil and gas reasonably foreseeable development (RFD) projection of 1,944 new wells (above the 1,815 wells present at that time) over a 10- to 15-year period beginning in 2000, and included 6,300 acres of new long-term disturbance (above the 14,076 acres present at that time).

As of March 2004, the WOGCC website listed 2,530 wells in the PFO area; these wells are estimated to require approximately 8,572 acres of long-term disturbance. Current oil and gas development proposals in the PFO could add approximately 3,310 more wells (more than the updated RFD), 5,190 acres of new long-term disturbance (less than the updated RFD), and existing RMP objectives would still be met. Based on all criteria, BLM has determined that this proposed project would not require an amendment of the PFO RMP (as updated in BLM [2000c]) if development at the proposed level is approved.

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## 1.4 AUTHORIZING ACTIONS AND RELATIONSHIP TO POLICIES, PLANS, AND PROGRAMS

A list of the major permits, approvals, and authorized actions necessary to construct, operate, maintain, and abandon project facilities is provided in Table 1.1.

### 1.4.1 Federal Permits, Authorizations, and Coordination

Drilling of federal minerals is subject to the BLM's Onshore Oil and Gas Orders (43 C.F.R. Subpart 3164 - Special Provisions). Operator drilling programs require BLM approval of each well and well pad on federal surface or federal minerals prior to commencement of drilling (see Figure 1.1). BLM reviews the drilling program through the APD process. BLM *Onshore Order Nos. 1 and 2* require an applicant to comply with the following conditions:

- operations must result in the diligent development and efficient recovery of resources;
- all activities must comply with applicable federal, state, and local laws and regulations applicable to federal leases; all activities must include adequate safeguards to protect the environment;
- disturbed lands must be properly reclaimed; and
- all activities must protect public health and safety.

*Onshore Order No. 1* specifically states that "lessees and operators shall be held fully accountable for their contractor's compliance with the requirements of the approved permit and/or plan" (48 *Federal Register* 56226, December 20, 1983).

Pipeline and road ROWs on federal lands would be issued under the authority of the *Mineral Leasing Act of 1920* as amended or FLPMA. ROW grants authorizing construction of ancillary facilities, access roads, and pipelines would grant the Operators certain rights that are subject to the terms and conditions incorporated into the grant by BLM.

Nine Presidential *Executive Orders* (EOs) affect implementation of the project. These EOs, which are binding on all government agencies, place restrictions on government approval of construction activities and apply to wetlands (EO 11990), floodplains management (EO 11988), migratory birds (EO 13186), environmental justice (EO 12898), Native American sacred sites (EO 13007), historic trails (EO 13195), cultural resources and historic preservation (EO 11593 and EO 13287), and invasive species (EO 13112).

Policies for development and land use decisions within the JIDPA are contained in the draft and final Pinedale Resource Area (now referred to as the PFO) Resource Management Plan (RMP)/EIS (BLM 1987a, 1987b), its ROD (BLM 1988b) and the Green River Resource Area (now referred to as the RSFO) RMP/EIS (BLM 1992a, 1996a) and its ROD (1997b). These two RMPs allocate which lands and/or minerals are appropriate for leasing. These documents also provide development guidelines. Both RODs indicate federal minerals will be made available for orderly and efficient development, and all minerals actions will comply with goals, objectives, and resource restrictions (mitigations) required to protect other resource values. Both the PFO

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Table 1.1 Major Federal, State, and Local Permits, Approvals, and Authorizing Actions for the Jonah Infill Drilling Project, Sublette County, Wyoming, 2004.<sup>1</sup>

Agency	Permit, Approval, or Action	Authority
Office of the President of the United States	Protection and enhancement of the cultural environment	Executive Order 11593
	Floodplains management	Executive Order 11988
	Protection of wetlands	Executive Order 11990
	Environmental justice	Executive Order 12898
	Indian sacred sites	Executive Order 13007
	Invasive species	Executive Order 13112
	Protection of migratory birds	Executive Order 13186
	Trails for America in the 21st century	Executive Order 13195
Bureau of Land Management (BLM)	Preserve America	Executive Order 13287
	Permit to drill, deepen, or plug back on federal onshore lands (APD/Sundry process); authorization for flaring and venting of natural gas on federal lands; plugging and abandonment of a well on federal lands	<i>Mineral Leasing Act of 1920</i> (30 United States Code [U.S.C.] 181 et seq.); 43 Code of Federal Regulation (C.F.R.) 3162
	Right-of-way grants and temporary use clearances on federal lands	<i>Mineral Leasing Act of 1920</i> , as amended (30 U.S.C. 185); 43 C.F.R. 3180; FLPMA (43 U.S.C. 1761 - 1771); 43 C.F.R. 2800
	Antiquities and cultural resource clearances on BLM-managed land	<i>Antiquities Act of 1906</i> (16 U.S.C. Section 431-433); <i>Archaeological Resources Public Protection Act of 1979</i> (16 U.S.C. Sections 470aa - 470ll); 43 C.F.R. 3
U.S. Army Corps of Engineers (COE)	Approval to dispose of produced water on BLM-managed land	<i>Mineral Leasing Act of 1920</i> (30 U.S.C. 181 et seq.); 43 C.F.R. 3164; <i>Onshore Oil and Gas Order No. 7</i>
	Section 404 permits and coordination regarding placement of dredged or fill material in area waters and adjacent wetlands	Section 404 of the <i>Clean Water Act of 1972</i> (40 C.F.R. 122 - 123, 230)
U.S. Fish and Wildlife Service (USFWS)	Coordination, consultation, and impact review on federally listed threatened and endangered (T&E) species	<i>Fish and Wildlife Coordination Act</i> (16 U.S.C. Sec. 661 et seq.); Section 7 of the <i>Endangered Species Act of 1973</i> , as amended (16 U.S.C. et seq.); <i>Bald Eagle Protection Act</i> , as amended (16 U.S.C. 668-668dd)
U.S. Environmental Protection Agency (EPA)	Spill Prevention, Control, and Countermeasure Plans (SPCCPs)	40 C.F.R. 112
	Regulation of hazardous waste treatment, storage, and/or disposal	<i>Resource Conservation and Recovery Act</i> (42 U.S.C. Section 6901)
U.S. Department of Energy (DOE)	Regulation of interstate pipeline product transportation	Various sections of the U.S.C. and C.F.R.
U.S. Department of Transportation (DOT)	Control of pipeline maintenance and operation	49 C.F.R. 191 and 192
Wyoming Board of Land Commissioners/Land and Investments Office	Approval of oil and gas leases, ROWs for long-term or permanent off-lease/off-unit roads and pipelines, temporary use permits, and developments on state lands	<i>Wyoming Statute</i> (W.S.) 37-1-101 et seq.

Table 1.1 (continued)

Agency	Permit, Approval, or Action	Authority
Wyoming Department of Environmental Quality - Water Quality Division (WDEQ/WQD)	Regulation of off-lease disposal of drilling fluids from abandoned reserve pits	<i>Wyoming Environmental Quality Act</i> (W.S. 35-11-301 through 35-11-311)
	National Pollutant Discharge Elimination System (NPDES) permits for discharging waste water and storm water runoff	WDEQ Rules and Regulations, Chapter 18, <i>Wyoming Environmental Quality Act</i> (W.S. 35-11-301 through 35-11-311); Section 405 of the <i>Clean Water Act</i> (40 C.F.R. 122-124)
	Administrative approval for discharge of hydrostatic test water	<i>Wyoming Environmental Quality Act</i> (W.S. 35-11-301 through 35-11-311)
Wyoming Department of Environmental Quality - Air Quality Division (WDEQ/AQD)	Permits to construct and permits to operate	<i>Clean Air Act</i> ; <i>Wyoming Environmental Quality Act</i> (W.S. 35-11-201 through 35-11-212)
Wyoming Department of Environmental Quality - Land Quality Division (WDEQ/LQD)	Mine permits, impoundments, and drill hole plugging on state lands	<i>Wyoming Environmental Quality Act</i> , Article 4, and Quality, as amended (W.S. 35-11-401 through 35-11-437)
Wyoming Department of Environmental Quality - Solid Waste Division	Construction fill permits and industrial waste facility permits for solid waste disposal during construction and operations	<i>Wyoming Environmental Quality Act</i> (W.S. 35-11-501 through 35-11-520)
Wyoming Department of Transportation (WDOT)	Permits for oversize, overlength, and overweight loads	Chapters 17 and 20 of the Wyoming Highway Department Rules and Regulations
Wyoming Oil and Gas Conservation Commission (WOGCC)	Permit to use earthen pit (reserve pits) on nonfederal lands	WOGCC Regulations (Section III; Rule 305)
	Authorization for flaring or venting of gas	WOGCC Regulations (Section III; Rule 326)
	Permit for Class II underground injection wells	WOGCC Regulations (Section III; Rule 346)
	Well plugging and abandonment	40 C.F.R. 146; 40 C.F.R. 147.2551
	Permit to drill, deepen, or plug back (APD process)	WOGCC Regulations (Section III; Rule 315)
	Change in depletion plans	<i>Wyoming Oil and Gas Act</i> (W.S. 30-5-110)
	Minimum safety standards for oil and gas activities	WOGCC Regulations (Rules 320-A, 327, and 328)
Wyoming State Engineer's Office (WSEO)	Permits to appropriate ground water (use, storage, wells, dewatering)	W.S. 41-121 through 147 (Form U.W.5)
	Permits to appropriate surface water	W.S. 41-201 (Form S.W.1)
Wyoming State Historic Preservation Office (SHPO)	Cultural resource protection, programmatic agreements, consultation	Section 106 of <i>National Historic Preservation Act</i> (NHPA) and Advisory Council Regulations (36 C.F.R. 800)
Sublette County	County road crossing/access permits	Planning and Zoning Department
	Small wastewater permits	Planning and Zoning Department
	Hazardous material recordation and storage	Emergency Management Coordinator
	Zone changes	Planning and Zoning Department
	Noxious weed control	Weed and Pest Department

<sup>1</sup> This list is intended to provide an overview of the key regulatory requirements that would govern project implementation. Additional approvals, permits, and authorizing actions may be necessary.



and RSFO planning areas (excluding specific locations outside the JIDPA) are open to consideration for exploration, leasing, and development for all leaseable minerals (e.g., oil, gas, coal). Execution of the Proposed Action or alternatives presented in this EIS is consistent with the management decisions presented in the PFO and RSFO RMP/RODs (BLM 1988b, 1997b).

The BLM also has specific provisions it must adhere to regarding the draining of federal minerals from adjoining nonfederal lands. These provisions are codified in 43 C.F.R. 3100.2 which states that, upon determination that lands owned by the U.S. are being drained of oil or gas by wells drilled on adjacent lands, the BLM may execute agreements with the owners of adjacent lands whereby the U.S. and its lessees shall be compensated for such drainage. In addition, where lands in any lease are being drained of their oil and gas content by wells either on another federal lease, issued at a lower rate or royalty, or on nonfederal lands, the lessee shall both drill and produce all wells necessary to protect the lease lands from drainage. In lieu of drilling necessary wells, the lessee may, with the consent of the BLM, pay compensatory royalty. These provisions are also incorporated in the lease terms contained in all federal oil and gas leases (Form 3100-11).

#### **1.4.1.1 Wyoming BLM Mitigation Guidelines and Practices for Surface Disturbing and Disruptive Activities**

Consistent with *Oil and Gas Onshore Order #1* regulations regarding leasing and operations, 43 CFR Parts 3100 and 3160 respectively, oil and gas leases are issued by the BLM. Stipulations may be added as terms of the lease to reflect management guidance established in the applicable Resource Management Plan (RMP). Once the lease is issued, the leaseholder/operator must apply for and receive site-specific authorization(s) prior to drilling within the leasehold area.

To meet required environmental obligations the leaseholder/operator must submit to the BLM an Application for Permit to Drill (APD) or its associated application for right-of-way (ROW) so that a site-specific environmental assessment (EA) may be prepared. EAs prepared for APD or ROW authorizations often include site-specific conditions of approval (COAs) that add further site-specific operation requirements based on the impact analysis in the EA.

The Wyoming BLM has adopted a standard set of guidelines and post-lease COAs that apply to all surface disturbing activities on Federal lands and minerals in Wyoming (see Appendix A). These mitigation guidelines encompass all aspects of environmental protection. Upon request by the applicant, an exception to a lease stipulation or a COA may be granted by the BLM following on-site review to see if the exception is warranted.

With the exception of five specific mitigations excluded from Alternative A, the standard Wyoming BLM mitigation guidelines are applied to all alternatives analyzed in this EIS.

#### **1.4.1.2 Conformance with BLM Pinedale and Green River Resource Management Plans**

The Operators' proposal is in conformance with the fluid minerals management objectives of the PFO and RSFO RMPs, including the RFD in the PFO RMP as updated by the ROD for the Pinedale Anticline Oil and Gas Exploration and Development Project (BLM 2000c) (see Section 1.3). Post-LOP, when full reclamation has occurred (habitat function is restored to 80% of pre-project levels), management within the JIDPA boundary would conform to all RMP objectives. Resource conditions within the JIDPA boundary during infill development and

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production may not be in full conformance with the RMPs; however, management objectives would be met within the Field Office as a whole during JIDPA development and production.

#### **1.4.2 State and Local Permits, Authorization, and Coordination**

The proposed project development alternatives are in conformance with the *Wyoming State Land Use Plan* (Wyoming State Land Use Commission 1979) and the *Sublette County Comprehensive Plan: County Vision, Goals and Policies* (Sublette County Board of Commissioners [SCBC] and Sublette County Planning Commission [SCPC] 2003). The alternatives comply with all relevant State and county laws and regulations (see Table 1.1).

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